

**NEW SOURCE CONSTRUCTION PERMIT
and
MINOR SOURCE OPERATING PERMIT
OFFICE OF AIR QUALITY**

**Analytical Engineering, Inc.
2555 Technology Blvd
Columbus, Indiana, 47202-2603**

(herein known as the Permittee) is hereby authorized to construct and operate subject to the conditions contained herein, the emission units described in Section A (Source Summary) of this permit.

This permit is issued to the above mentioned company under the provisions of 326 IAC 2-1.1, 326 IAC 2-5.1, 326 IAC 2-6.1 and 40 CFR 52.780, with conditions listed on the attached pages.

Operation Permit No.: CP 005-14641-00091	
Issued by: Original Signed by Paul Dubenetzky Paul Dubenetzky, Branch Chief Office of Air Quality	Issuance Date: March 20, 2002

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SECTION A

SOURCE SUMMARY

This permit is based on information requested by the Indiana Department of Environmental Management (IDEM), Office of Air Quality (OAQ). The information describing the source contained in conditions A.1 through A.3 is descriptive information and does not constitute enforceable conditions. However, the Permittee should be aware that a physical change or a change in the method of operation that may render this descriptive information obsolete or inaccurate may trigger requirements for the Permittee to obtain additional permits or seek modification of this permit pursuant to 326 IAC 2, or change other applicable requirements presented in the permit application.

A.1 General Information [326 IAC 2-5.1-3(c)] [326 IAC 2-6.1-4(a)]

The Permittee owns and operates a stationary diesel engine test facility.

Authorized Individual:	President
Source Address:	2555 Technology Blvd., Columbus, Indiana 47202
Mailing Address:	P.O. Box 2603, Columbus, Indiana 47202
Phone Number:	(812) 376-6472
SIC Code:	8734
County Location:	Bartholomew
County Status:	Attainment for all criteria pollutants
Source Status:	Minor Source Operating Permit
	Minor Source, under PSD or Emission Offset Rules

A.2 Emissions units and Pollution Control Equipment Summary

This stationary source is approved to construct and operate the following emissions units and pollution control devices:

Ten (10) diesel engine test cells, identified as emission units TC1 through TC10, with a total maximum capacity of 5,800 hp limited by 21.5% because of heat rejection capacity requirements for a total operating maximum of 1,247 hp, constructed between January 2002 and March 2003, exhausting at stacks ES1 through ES10.

SECTION B GENERAL CONSTRUCTION CONDITIONS

B.1 Permit No Defense [IC 13]

This permit to construct does not relieve the Permittee of the responsibility to comply with the provisions of the Indiana Environmental Management Law (IC 13-11 through 13-20; 13-22 through 13-25; and 13-30), the Air Pollution Control Law (IC 13-17) and the rules promulgated thereunder, as well as other applicable local, state, and federal requirements.

B.2 Definitions

Terms in this permit shall have the definition assigned to such terms in the referenced regulation. In the absence of definitions in the referenced regulation, any applicable definitions found in IC 13-11, 326 IAC 1-2, and 326 IAC 2-1.1-1 shall prevail.

B.3 Effective Date of the Permit [IC13-15-5-3]

Pursuant to IC 13-15-5-3, this permit becomes effective upon its issuance.

B.4 Revocation of Permits [326 IAC 2-1.1-9(5)]

Pursuant to 326 IAC 2-1.1-9(5)(Revocation of Permits), the Commissioner may revoke this permit if construction is not commenced within eighteen (18) months after receipt of this approval or if construction is suspended for a continuous period of one (1) year or more.

B.5 Modification to Permit [326 IAC 2]

Notwithstanding the Section B condition entitled "Minor Source Operating Permit", all requirements and conditions of this construction permit shall remain in effect unless modified in a manner consistent with procedures established for modifications of construction permits pursuant to 326 IAC 2 (Permit Review Rules).

B.6 Minor Source Operating Permit [326 IAC 2-6.1]

This document shall also become a minor source operating permit pursuant to 326 IAC 2-6.1 when, prior to start of operation, the following requirements are met:

- (a) The attached Affidavit of Construction shall be submitted to the Office of Air Quality (OAQ), Permit Administration & Development Section.
 - (1) If the Affidavit of Construction verifies that the facilities covered in this Construction Permit were constructed as proposed in the application, then the facilities may begin operating on the date the Affidavit of Construction is postmarked or hand delivered to IDEM.
 - (2) If the Affidavit of Construction does not verify that the facilities covered in this Construction Permit were constructed as proposed in the application, then the Permittee shall receive an Operation Permit Validation Letter from the Chief of the Permit Administration & Development Section prior to beginning operation of the facilities.
- (b) If construction is completed in phases; i.e., the entire construction is not done continuously, a separate affidavit must be submitted for each phase of construction. Any permit conditions associated with operation start up dates such as stack testing for New Source Performance Standards (NSPS) shall be applicable to each individual phase.
- (c) Upon receipt of the Operation Permit Validation Letter from the Chief of the Permit Administration & Development Section, the Permittee shall attach it to this document.
- (d) The operation permit will be subject to annual operating permit fees pursuant to 326 IAC 2-1.1-7(Fees).

- (e) Pursuant to 326 IAC 2-6.1-7, the Permittee shall apply for an operation permit renewal at least ninety (90) days prior to the expiration date established in the validation letter. If IDEM, OAQ, upon receiving a timely and complete permit application, fails to issue or deny the permit renewal prior to the expiration date of this permit, this existing permit shall not expire and all terms and conditions shall continue in effect until the renewal permit has been issued or denied. The operation permit issued shall contain as a minimum the conditions in Section C and Section D of this permit.

B.7 Permit Term [326 IAC 2-6.1-7]

This permit is issued for a fixed term of five (5) years from the original date, as determined in accordance with IC 4-21.5-3-5(f) and IC 13-15-5-3. Subsequent revisions, modifications or amendments of this permit do not affect the expiration

SECTION C

SOURCE OPERATION CONDITIONS

Entire Source

C.1 PSD Minor Source Status [326 IAC 2-2] [40 CFR 52.21]

- (a) The total source potential to emit of all criteria pollutants is less than 250 tons per year. Therefore the requirements of 326 IAC 2-2 (Prevention of Significant Deterioration) and 40 CFR 52.21 will not apply.
- (b) Any change or modification which may increase potential to emit to 250 tons per year from this source, shall cause this source to be considered a major source under PSD, 326 IAC 2-2 and 40 CFR 52.21, and shall require approval from IDEM, OAQ prior to making the change.
- (c) Any change or modification which may increase potential to emit to ten (10) tons per year of any single hazardous air pollutant, twenty-five (25) tons per year of any combination of hazardous air pollutants, or one hundred (100) tons per year of any other regulated pollutant from this source, shall cause this source to be considered a major source under Part 70 Permit Program, 326 IAC 2-7, and shall require approval from IDEM, OAQ prior to making the change.

C.2 Preventive Maintenance Plan [326 IAC 1-6-3]

- (a) If required by specific condition(s) in Section D of this permit, the Permittee shall prepare and maintain Preventive Maintenance Plans (PMP) after issuance of this permit, including the following information on each emissions unit:
 - (1) Identification of the individual(s) responsible for inspecting, maintaining, and repairing emission control devices;
 - (2) A description of the items or conditions that will be inspected and the inspection schedule for said items or conditions;
 - (3) Identification and quantification of the replacement parts that will be maintained in inventory for quick replacement.
- (b) The Permittee shall implement the Preventive Maintenance Plans as necessary to ensure that failure to implement the Preventive Maintenance Plan does not cause or contribute to a violation of any limitation on emissions or potential to emit.
- (c) PMP's shall be submitted to IDEM, OAQ, upon request and shall be subject to review and approval by IDEM, OAQ. IDEM, OAQ, may require the Permittee to revise its Preventive Maintenance Plan whenever lack of proper maintenance causes or contributes to any violation.

C.3 Permit Revision [326 IAC 2-5.1-3(e)(3)] [326 IAC 2-6.1-6]

- (a) The Permittee must comply with the requirements of 326 IAC 2-6.1-6 whenever the Permittee seeks to amend or modify this permit.
- (b) Any application requesting an amendment or modification of this permit shall be submitted to:

Indiana Department of Environmental Management
Permits Branch, Office of Air Quality
100 North Senate Avenue, P.O. Box 6015
Indianapolis, Indiana 46206-6015

Any such application should be certified by the “authorized individual” as defined by 326 IAC 2-1.1-1.

- (c) The Permittee shall notify the OAQ within thirty (30) calendar days of implementing a notice-only change. [326 IAC 2-6.1-6(d)]

C.4 Inspection and Entry [326 IAC 2-5.1-3(e)(4)(B)] [326 IAC 2-6.1-5(a)(4)]

Upon presentation of proper identification cards, credentials, and other documents as may be required by law, and subject to the Permittee’s right under all applicable laws and regulations to assert that the information collected by the agency is confidential and entitled to be treated as such, the Permittee shall allow IDEM, OAQ, U.S. EPA, or an authorized representative to perform the following:

- (a) Enter upon the Permittee’s premises where a permitted source is located, or emissions related activity is conducted, or where records must be kept under the conditions of this permit;
- (b) Have access to and copy, at reasonable times, any records that must be kept under this title or the conditions of this permit or any operating permit revisions;
- (c) Inspect, at reasonable times, any processes, emissions units (including monitoring and air pollution control equipment), practices, or operations regulated or required under this permit or any operating permit revisions;
- (d) Sample or monitor, at reasonable times, substances or parameters for the purpose of assuring compliance with this permit or applicable requirements; and
- (e) Utilize any photographic, recording, testing, monitoring, or other equipment for the purpose of assuring compliance with this permit or applicable requirements.

C.5 Transfer of Ownership or Operation [326 IAC 2-6.1-6(d)(3)]

Pursuant to [326 IAC 2-6.1-6(d)(3)] :

- (a) In the event that ownership of this source is changed, the Permittee shall notify IDEM, OAQ, Permits Branch, within thirty (30) days of the change.
- (b) The written notification shall be sufficient to transfer the permit to the new owner by an notice-only change pursuant to 326 IAC 2-6.1-6(d)(3).
- (c) IDEM, OAQ shall issue a revised permit.

The notification which shall be submitted by the Permittee does require the certification by the “authorized individual” as defined by 326 IAC 2-1.1-1.

C.6 Permit Revocation [326 IAC 2-1-9]

Pursuant to 326 IAC 2-19(a)(Revocation of Permits), this permit to construct and operate may be revoked for any of the following causes:

- (a) Violation of any conditions of this permit.
- (b) Failure to disclose all the relevant facts, or misrepresentation in obtaining this permit.
- (c) Changes in regulatory requirements that mandate either a temporary or permanent reduction of discharge of contaminants. However, the amendment of appropriate sections of this permit shall not require revocation of this permit.

- (d) Noncompliance with orders issued pursuant to 326 IAC 1-5 (Episode Alert Levels) to reduce emissions during an air pollution episode.
- (e) For any cause which establishes in the judgment of IDEM, the fact that continuance of this permit is not consistent with purposes of this article.

C.7 Opacity [326 IAC 5-1]

Pursuant to 326 IAC 5-1-2 (Opacity Limitations), except as provided in 326 IAC 5-1-3 (Temporary Alternative Opacity Limitations), opacity shall meet the following, unless otherwise stated in this permit:

- (a) Opacity shall not exceed an average of forty percent (40%) in any one (1) six (6) minute averaging period as determined in 326 IAC 5-1-4.
- (b) Opacity shall not exceed sixty percent (60%) for more than a cumulative total of fifteen (15) minutes (sixty (60) readings as measured according to 40 CFR 60, Appendix A, Method 9 or fifteen (15) one (1) minute nonoverlapping integrated averages for a continuous opacity monitor) in a six (6) hour period.

C.8 Fugitive Dust Emissions [326 IAC 6-4]

The Permittee shall not allow fugitive dust to escape beyond the property line or boundaries of the property, right-of-way, or easement on which the source is located, in a manner that would violate 326 IAC 6-4 (Fugitive Dust Emissions). 326 IAC 6-4-2(4) is not federally enforceable.

Testing Requirements

C.9 Performance Testing [326 IAC 3-6]

- (a) Compliance testing on new emissions units shall be conducted within 60 days after achieving maximum production rate, but no later than 180 days after initial start-up, if specified in Section D of this approval. All testing shall be performed according to the provisions of 326 IAC 3-6 (Source Sampling Procedures), except as provided elsewhere in this permit, utilizing any applicable procedures and analysis methods specified in 40 CFR 51, 40 CFR 60, 40 CFR 61, 40 CFR 63, 40 CFR 75, or other procedures approved by IDEM, OAQ.

A test protocol, except as provided elsewhere in this permit, shall be submitted to:

Indiana Department of Environmental Management
Compliance Data Section, Office of Air Quality
100 North Senate Avenue, P. O. Box 6015
Indianapolis, Indiana 46206-6015

no later than thirty-five (35) days prior to the intended test date. The Permittee shall submit a notice of the actual test date to the above address so that it is received at least two weeks prior to the test date.

- (b) All test reports must be received by IDEM, OAQ within forty-five (45) days after the completion of the testing. An extension may be granted by the IDEM, OAQ if the source submits to IDEM, OAQ, a reasonable written explanation within five (5) days prior to the end of the initial forty-five (45) day period.

The documentation submitted by the Permittee does not require certification by the "authorized individual" as defined by 326 IAC 2-1.1-1.

Compliance Monitoring Requirements

C.10 Compliance Monitoring [326 IAC 2-1.1-11]

Compliance with applicable requirements shall be documented as required by this permit. The Permittee shall be responsible for installing any necessary equipment and initiating any required monitoring related to that equipment. All monitoring and record keeping requirements not already legally required shall be implemented when operation begins.

C.11 Monitoring Methods [326 IAC 3]

Any monitoring or testing required by Section D of this permit shall be performed according to the provisions of 326 IAC 3, 40 CFR 60, Appendix A, or other approved methods as specified in this permit.

- (a) For each compliance monitoring condition of this permit, appropriate response steps shall be taken when indicated by the provisions of that compliance monitoring condition. Failure to perform the actions detailed in the compliance monitoring conditions or failure to take the response steps within the time prescribed in the Compliance Response Plan, shall constitute a violation of the permit unless taking the response steps set forth in the Compliance Response Plan would be unreasonable.
- (b) After investigating the reason for the excursion, the Permittee is excused from taking further response steps for any of the following reasons:
 - (1) The monitoring equipment malfunctioned, giving a false reading. This shall be an excuse from taking further response steps providing that prompt action was taken to correct the monitoring equipment.
 - (2) The Permittee has determined that the compliance monitoring parameters established in the permit conditions are technically inappropriate, has previously submitted a request for an administrative amendment to the permit, and such request has not been denied or;
 - (3) An automatic measurement was taken when the process was not operating; or
 - (4) The process has already returned to operating within "normal" parameters and no response steps are required.
- (c) Records shall be kept of all instances in which the compliance related information was not met and of all response steps taken.

C.12 Actions Related to Noncompliance Demonstrated by a Stack Test

- (a) When the results of a stack test performed in conformance with Section C - Performance Testing, of this permit exceed the level specified in any condition of this permit, the Permittee shall take appropriate corrective actions. The Permittee shall submit a description of these corrective actions to IDEM, OAQ, within thirty (30) days of receipt of the test results. The Permittee shall take appropriate action to minimize emissions from the affected emissions unit while the corrective actions are being implemented. IDEM, OAQ shall notify the Permittee within thirty (30) days, if the corrective actions taken are deficient. The Permittee shall submit a description of additional corrective actions taken to IDEM, OAQ within thirty (30) days of receipt of the notice of deficiency. IDEM, OAQ reserves the authority to use enforcement activities to resolve noncompliant stack tests.
- (b) A retest to demonstrate compliance shall be performed within one hundred twenty (120) days of receipt of the original test results. Should the Permittee demonstrate to IDEM, OAQ that retesting in one-hundred and twenty (120) days is not practicable, IDEM, OAQ may extend the retesting deadline. Failure of the second test to demonstrate

compliance with the appropriate permit conditions may be grounds for immediate revocation of the permit to operate the affected emissions unit.

The documents submitted pursuant to this condition do not require the certification by the "authorized individual" as defined by 326 IAC 2-1.1-1.

Record Keeping and Reporting Requirements

C.13 Malfunctions Report [326 IAC 1-6-2]

Pursuant to 326 IAC 1-6-2 (Records; Notice of Malfunction):

- (a) A record of all malfunctions, including startups or shutdowns of any facility or emission control equipment, which result in violations of applicable air pollution control regulations or applicable emission limitations shall be kept and retained for a period of three (3) years and shall be made available to the Indiana Department of Environmental Management (IDEM), Office of Air Quality(OAQ) or appointed representative upon request.
- (b) When a malfunction of any facility or emission control equipment occurs which lasts more than one (1) hour, said condition shall be reported to OAQ, using the Malfunction Report Forms (2 pages). Notification shall be made by telephone or facsimile, as soon as practicable, but in no event later than four (4) daytime business hours after the beginning of said occurrence.
- (c) Failure to report a malfunction of any emission control equipment shall constitute a violation of 326 IAC 1-6, and any other applicable rules. Information of the scope and expected duration of the malfunction shall be provided, including the items specified in 326 IAC 1-6-2(a)(1) through (6).
- (d) Malfunction is defined as any sudden, unavoidable failure of any air pollution control equipment, process, or combustion or process equipment to operate in a normal and usual manner. [326 IAC 1-2-39]

C.14 Monitoring Data Availability [326 IAC 2-6.1-2] [IC 13-14-1-13]

- (a) With the exception of performance tests conducted in accordance with Section C-Performance Testing, all observations, sampling, maintenance procedures, and record keeping, required as a condition of this permit shall be performed at all times the equipment is operating at normal representative conditions.
- (b) As an alternative to the observations, sampling, maintenance procedures, and record keeping of subsection (a) above, when the equipment listed in Section D of this permit is not operating, the Permittee shall either record the fact that the equipment is shut down or perform the observations, sampling, maintenance procedures, and record keeping that would otherwise be required by this permit.
- (c) If the equipment is operating but abnormal conditions prevail, additional observations and sampling should be taken with a record made of the nature of the abnormality.
- (d) If for reasons beyond its control, the operator fails to make required observations, sampling, maintenance procedures, or record keeping, reasons for this must be recorded.
- (e) At its discretion, IDEM may excuse such failure providing adequate justification is documented and such failures do not exceed five percent (5%) of the operating time in any quarter.

- (f) Temporary, unscheduled unavailability of staff qualified to perform the required observations, sampling, maintenance procedures, or record keeping shall be considered a valid reason for failure to perform the requirements stated in (a) above.

C.15 General Record Keeping Requirements [326 IAC 2-6.1-2]

- (a) Records of all required monitoring data and support information shall be retained for a period of at least five (5) years from the date of monitoring sample, measurement, report, or application. These records shall be kept at the source location for a minimum of three (3) years and available upon the request of an IDEM, OAQ representative. The records may be stored elsewhere for the remaining two (2) years as long as they are available upon request. If the Commissioner makes a written request for records to the Permittee, the Permittee shall furnish the records to the Commissioner within a reasonable time.
- (b) Records of required monitoring information shall include, where applicable:
 - (1) The date, place, and time of sampling or measurements;
 - (2) The dates analyses were performed;
 - (3) The company or entity performing the analyses;
 - (4) The analytic techniques or methods used;
 - (5) The results of such analyses; and
 - (6) The operating conditions existing at the time of sampling or measurement.
- (c) Support information shall include, where applicable:
 - (1) Copies of all reports required by this permit;
 - (2) All original strip chart recordings for continuous monitoring instrumentation;
 - (3) All calibration and maintenance records;
- (d) All record keeping requirements not already legally required shall be implemented when operation begins.

C.16 General Reporting Requirements [326 IAC 2-1.1-11] [326 IAC 2-6.1-2] [IC 13-14-1-13]

- (a) Reports required by conditions in Section D of this permit shall be submitted to:

Indiana Department of Environmental Management
Compliance Data Section, Office of Air Quality
100 North Senate Avenue, P. O. Box 6015
Indianapolis, Indiana 46206-6015
- (b) Unless otherwise specified in this permit, any notice, report, or other submission required by this permit shall be considered timely if the date postmarked on the envelope or certified mail receipt, or affixed by the shipper on the private shipping receipt, is on or before the date it is due. If the document is submitted by any other means, it shall be considered timely if received by IDEM, OAQ on or before the date it is due.
- (c) The first report shall cover the period commencing on the date of issuance of this permit and ending on the last day of the reporting period.

C.17 Annual Notification [326 IAC 2-6.1-5(a)(5)]

- (a) Annual notification shall be submitted to the Office of Air Quality stating whether or not the source is in operation and in compliance with the terms and conditions contained in this permit.
- (b) Noncompliance with any condition must be specifically identified. If there are any permit conditions or requirements for which the source is not in compliance at any time during the year, the Permittee must provide a narrative description of how the source did or will achieve compliance and the date compliance was, or will be, achieved. The notification must be signed by an authorized individual.
- (c) The annual notice shall cover the time period from January 1 to December 31 of the previous year, and shall be submitted in the format attached no later than March 1 of each year to:

Compliance Branch, Office of Air Quality
Indiana Department of Environmental Management
100 North Senate Avenue, P.O. Box 6015
Indianapolis, IN 46206-6015
- (d) The notification shall be considered timely if the date postmarked on the envelope or certified mail receipt, or affixed by the shipper on the private shipping receipt, is on or before the date it is due. If the document is submitted by any other means, it shall be considered timely if received by IDEM, OAQ on or before the date it is due.

SECTION D.1

EMISSIONS UNIT OPERATION CONDITIONS

Facility Description:

Ten (10) diesel engine test cells, identified as emission units TC1 through TC10, with a total maximum capacity of 5,800 hp limited by 21.5% because of heat rejection capacity requirements for a total operating maximum of 1,247 hp to be constructed between January 2002 and March 2003, exhausting at stacks ES1 through ES10.

(The information describing the process contained in this facility description box is descriptive information and does not constitute enforceable conditions.)

Emission Limitations and Standards

D.1.1 Nitrogen Oxides (NOx)

- (a) The diesel test cells shall use less than 558,012 gallons per twelve (12) consecutive months, rolled on a monthly basis. This is equivalent to NOx PTE of less than 100 tons per year at a rate of 355 pounds of NOx per 1000 gallons of diesel fuel. Therefore, 326 IAC 2-7 does not apply.
- (b) Any changes or modifications which may increase the potential emissions to 100 tons per year or more of NOx must be approved by the IDEM OAQ before such changes may occur.

Record Keeping and Reporting Requirements [326 IAC 2-5.1-3(e)(2)] [326 IAC 2-6.1-5(a)(2)]

D.1.2 Record Keeping Requirements

- (a) To document compliance with Condition D.1.1, the Permittee shall keep and maintain monthly records at the source of the total amount of diesel fuel used at the source.
- (b) All records shall be maintained in accordance with Section C - General Record Keeping Requirements of this permit.

**INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
OFFICE OF AIR QUALITY
Compliance Branch**

**MINOR SOURCE OPERATING PERMIT
ANNUAL NOTIFICATION**

This form should be used to comply with the notification requirements under
326 IAC 2-6.1-5(a)(5).

Company Name:	Analytical Engineering, Inc.
Address:	2555 Technology Blvd.
City:	Columbus, Indiana 47202
Phone #:	(812) 376-6472
MSOP #:	005-14641-00091

I hereby certify that Analytical Engineering Inc., is

☒ still in operation.

☐ no longer in operation.

I hereby certify that Analytical Engineering, Inc., is

☒ in compliance with the requirements of MSOP
005-14641-00091

☐ not in compliance with the requirements of
MSOP 005-14641-00091

Authorized Individual (typed):
Title:
Signature:
Date:

If there are any conditions or requirements for which the source is not in compliance, provide a narrative description of how the source did or will achieve compliance and the date compliance was, or will be achieved.

Noncompliance:

MALFUNCTION REPORT

**INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
OFFICE OF AIR QUALITY
FAX NUMBER - 317 233-5967**

**This form should only be used to report malfunctions applicable to Rule 326 IAC 1-6
and to qualify for the exemption under 326 IAC 1-6-4.**

THIS FACILITY MEETS THE APPLICABILITY REQUIREMENTS BECAUSE IT HAS POTENTIAL TO EMIT 25 TONS/YEAR PARTICULATE MATTER ?_____, 25 TONS/YEAR SULFUR DIOXIDE ?_____, 25 TONS/YEAR NITROGEN OXIDES?_____, 25 TONS/YEAR VOC ?_____, 25 TONS/YEAR HYDROGEN SULFIDE ?_____, 25 TONS/YEAR TOTAL REDUCED SULFUR ?_____, 25 TONS/YEAR REDUCED SULFUR COMPOUNDS ?_____, 25 TONS/YEAR FLUORIDES ?_____, 100TONS/YEAR CARBON MONOXIDE ?_____, 10 TONS/YEAR ANY SINGLE HAZARDOUS AIR POLLUTANT ?_____, 25 TONS/YEAR ANY COMBINATION HAZARDOUS AIR POLLUTANT ?_____, 1 TON/YEAR LEAD OR LEAD COMPOUNDS MEASURED AS ELEMENTAL LEAD ?_____, OR IS A SOURCE LISTED UNDER 326 IAC 2-5.1-3(2) ?_____. EMISSIONS FROM MALFUNCTIONING CONTROL EQUIPMENT OR PROCESS EQUIPMENT CAUSED EMISSIONS IN EXCESS OF APPLICABLE LIMITATION _____.

THIS MALFUNCTION RESULTED IN A VIOLATION OF: 326 IAC _____ OR, PERMIT CONDITION # _____ AND/OR PERMIT LIMIT OF _____

THIS INCIDENT MEETS THE DEFINITION OF 'MALFUNCTION' AS LISTED ON REVERSE SIDE ? Y N

THIS MALFUNCTION IS OR WILL BE LONGER THAN THE ONE (1) HOUR REPORTING REQUIREMENT ? Y N

COMPANY: _____ PHONE NO. () _____
LOCATION: (CITY AND COUNTY) _____
PERMIT NO. _____ AFS PLANT ID: _____ AFS POINT ID: _____ INSP: _____
CONTROL/PROCESS DEVICE WHICH MALFUNCTIONED AND REASON: _____

DATE/TIME MALFUNCTION STARTED: ____/____/20____ AM / PM

ESTIMATED HOURS OF OPERATION WITH MALFUNCTION CONDITION: _____

DATE/TIME CONTROL EQUIPMENT BACK-IN SERVICE ____/____/20____ AM/PM

TYPE OF POLLUTANTS EMITTED: TSP, PM-10, SO₂, VOC, OTHER: _____

ESTIMATED AMOUNT OF POLLUTANT EMITTED DURING MALFUNCTION: _____

MEASURES TAKEN TO MINIMIZE EMISSIONS: _____

REASONS WHY FACILITY CANNOT BE SHUTDOWN DURING REPAIRS:

CONTINUED OPERATION REQUIRED TO PROVIDE ESSENTIAL* SERVICES: _____

CONTINUED OPERATION NECESSARY TO PREVENT INJURY TO PERSONS: _____

CONTINUED OPERATION NECESSARY TO PREVENT SEVERE DAMAGE TO EQUIPMENT: _____

INTERIM CONTROL MEASURES: (IF APPLICABLE) _____

MALFUNCTION REPORTED BY: _____ TITLE: _____
(SIGNATURE IF FAXED)

MALFUNCTION RECORDED BY: _____ DATE: _____ TIME: _____

*SEE PAGE 2

**Please note - This form should only be used to report malfunctions
applicable to Rule 326 IAC 1-6 and to qualify for
the exemption under 326 IAC 1-6-4.**

326 IAC 1-6-1 Applicability of rule

Sec. 1. This rule applies to the owner or operator of any facility required to obtain a permit under 326 IAC 2-5.1 or 326 IAC 2-6.1.

326 IAC 1-2-39 "Malfunction" definition

Sec. 39. Any sudden, unavoidable failure of any air pollution control equipment, process, or combustion or process equipment to operate in a normal and usual manner.

***Essential services** are interpreted to mean those operations, such as, the providing of electricity by power plants. Continued operation solely for the economic benefit of the owner or operator shall not be sufficient reason why a facility cannot be shutdown during a control equipment shutdown.

If this item is checked on the front, please explain rationale:

Indiana Department of Environmental Management Office of Air Quality

Addendum to the Technical Support Document for a New Source Construction and Minor Source Operating Permit

Source Background and Description

Source Name: Analytical Engineering, Inc.
Source Location: 2555 Technology Blvd., Columbus, Indiana 47202
County: Bartholomew
SIC Code: 8734
Operation Permit No.: 005-14641-00091
Permit Reviewer: ERG/EH

On February 4, 2002, the Office of Air Quality (OAQ) had a notice published in The Republic, Columbus, Indiana, stating that Analytical Engineering, Inc had applied for a Minor Source Operating Permit (MSOP) relating to the construction and operation of a diesel engine test facility. The notice also stated that OAQ proposed to issue a permit for this operation and provided information on how the public could review the proposed permit and other documentation. Finally, the notice informed interested parties that there was a period of thirty (30) days to provide comments on whether or not this permit should be issued as proposed.

Upon further review, the OAQ has decided to make the following revisions to the permit (bolded language has been added, the language with a line through it has been deleted). The Table of Contents has been modified to reflect these changes.

1. There is no required Preventive Maintenance Plan or Compliance Monitoring Plan in Section D. Therefore, the reference to these plans under Condition C.15 General Record Keeping Requirements [326 IAC 2-6.1-2] has been deleted.

C.15 General Record Keeping Requirements [326 IAC 2-6.1-2]

- (c) Support information shall include, where applicable:

- (1) Copies of all reports required by this permit;
- (2) All original strip chart recordings for continuous monitoring instrumentation;
- (3) All calibration and maintenance records;
- (4) ~~Records of preventive maintenance shall be sufficient to demonstrate that failure to implement the Preventive Maintenance Plan did not cause or contribute to a violation of any limitation on emissions or potential to emit. To be relied upon subsequent to any such violation, these records may include, but are not limited to: work orders, parts inventories, and operator's standard operating procedures. Records of response steps taken shall indicate whether the response steps were performed in accordance with the Compliance Response Plan required by Section C - Compliance Monitoring Plan - Failure to take Response Steps, of this permit, and whether a deviation from a permit condition~~

~~was reported. All records shall briefly describe what maintenance and response steps were taken and indicate who performed the tasks.~~

Indiana Department of Environmental Management Office of Air Quality

Technical Support Document (TSD) for a New Source Construction and Minor Source Operating Permit

Source Background and Description

Source Name: Analytical Engineering, Inc.
Source Location: 2555 Technology Blvd., Columbus, Indiana 47202
County: Bartholomew
SIC Code: 8734
Operation Permit No.: 005-14641-00091
Permit Reviewer: ERG/EH

The Office of Air Quality (OAQ) has reviewed an application from Analytical Engineering, Inc. relating to the construction and operation of a diesel engine test facility.

Permitted Emission Units and Pollution Control Equipment

There are no permitted facilities operating at this source during this review process.

Unpermitted Emission Units and Pollution Control Equipment

There are no unpermitted facilities operating at this source during this review process.

New Emission Units and Pollution Control Equipment Receiving Prior Approval

Ten (10) diesel engine test cells, identified as emission unit TC1 through TC10, with a total maximum capacity of 5,800 hp, limited by 21.5% because of heat rejection capacity requirements for a total operating maximum of 1247 hp constructed between January 2002 and March 2003, exhausting at stacks ES1 through ES10.

Existing Approvals

This is the first approval for this source.

Enforcement Issue

There are no enforcement actions pending.

Recommendation

The staff recommends to the Commissioner that the construction and operation be approved. This recommendation is based on the following facts and conditions:

Unless otherwise stated, information used in this review was derived from the application and additional information submitted by the applicant.

An application for the purposes of this review was received on October 5, 2001, with additional information received on December 26, 2001.

Emission Calculations

The calculations submitted by the applicant have been verified and found to be accurate and correct. These calculations are provided in Appendix A of this document (pages 1 through 5).

Potential To Emit of Source Before Controls

Pursuant to 326 IAC 2-1.1-1(16), Potential to Emit is defined as "the maximum capacity of a stationary source or emissions unit to emit any air pollutant under its physical and operational design. Any physical or operational limitation on the capacity of a source to emit an air pollutant, including air pollution control equipment and restrictions on hours of operation or type or amount of material combusted, stored, or processed shall be treated as part of its design if the limitation is enforceable by the U. S. EPA, the department, or the appropriate local air pollution control agency."

Pollutant	Potential To Emit (tons/year)
PM	3.0
PM-10	3.0
SO ₂	2.0
VOC	5.0
CO	15.6
NO _x	*99

*The type of engine testing being done at Analytical Engineering is the same type of engine testing conducted at Cummins Engine Co., Columbus Technical Center - Plant 5, 1900 McKinley Ave., Columbus. The emission factors are based on 1994 actual test data of these diesel engine test cells. However, using either the 1994 test data or AP-42 emission factor, the result would be both less than 100 tons per year.

- (a) The potential to emit (as defined in 326 IAC 2-7-1(29)) of pollutants are less than 100 tons per year. Therefore, the source is not subject to the provisions of 326 IAC 2-7.
- (b) The potential to emit (as defined in 326 IAC 2-7-1(29)) of pollutants are greater than 25 tons per year, therefore, the source is subject to the provisions of 326 IAC 2-6.1.
- (c) The potential to emit (as defined in 326 IAC 2-7-1(29)) of any single HAP is less than ten (10) tons per year and/or the potential to emit (as defined in 326 IAC 2-7-1(29)) of a combination of HAPs is less than twenty-five (25) tons per year, therefore, the source is not subject to the provisions of 326 IAC 2-7.
- (d) This type of operation is not one of the twenty-eight (28) listed source categories under 326 IAC 2-2.

County Attainment Status

The source is located in Bartholomew County.

Pollutant	Status
PM-10	Attainment
SO ₂	Attainment
NO ₂	Attainment
Ozone	Attainment
CO	Attainment
Lead	Attainment

- (a) Volatile organic compounds (VOC) are precursors for the formation of ozone. Therefore, VOC emissions are considered when evaluating the rule applicability relating to the ozone standards. Bartholomew County has been designated as attainment or unclassifiable for ozone. Therefore, VOC emissions were reviewed pursuant to the requirements for Prevention of Significant Deterioration (PSD), 326 IAC 2-2 and 40 CFR 52.21.
- (b) Bartholomew County has been classified as attainment or unclassifiable for PM-10, SO₂, NO_x, CO, and lead. Therefore, these emissions were reviewed pursuant to the requirements for Prevention of Significant Deterioration (PSD), 326 IAC 2-2 and 40 CFR 52.21.

Source Status

New Source PSD Definition (emissions after controls, based on 8,760 hours of operation per year at rated capacity and/ or as otherwise limited):

Pollutant	Emissions (ton/yr)
PM	3.0
PM10	3.0
SO ₂	2.0
VOC	5.0*
CO	15.6
NO _x	99
Single HAP	less than 5.0*
Combination HAPs	less than 5.0*

*The maximum HAP will not exceed the VOC emissions.

- (a) This new source is not a major stationary source because no attainment pollutant is emitted at a rate of 250 tons per year or greater and it is not in one of the 28 listed source categories. Therefore, pursuant to 326 IAC 2-2, and 40 CFR 52.21, the PSD requirements do not apply.

Part 70 Permit Determination

326 IAC 2-7 (Part 70 Permit Program)

This new source is not subject to the Part 70 Permit requirements because the potential to emit (PTE) of:

- (a) each criteria pollutant is less than 100 tons per year,
- (b) a single hazardous air pollutant (HAP) is less than 10 tons per year, and
- (c) any combination of HAPs is less than 25 tons/year.

This is the first air approval issued to this source.

Federal Rule Applicability

- (a) There are no New Source Performance Standards (NSPS) (326 IAC 12 and 40 CFR Part 60) applicable to this source.

- (b) There are no National Emission Standards for Hazardous Air Pollutants (NESHAPs)(326 IAC 14 and 40 CFR Part 63) applicable to this source.

State Rule Applicability - Entire Source

326 IAC 2-6 (Emission Reporting)

This source is located in Bartholomew County and the potential to emit of NO_x is less than one hundred (100) tons per year. Therefore, 326 IAC 2-6 does not apply.

326 IAC 5-1 (Visible Emissions Limitations)

Pursuant to 326 IAC 5-1-2 (Opacity Limitations), except as provided in 326 IAC 5-1-3 (Temporary Alternative Opacity Limitations), opacity shall meet the following, unless otherwise stated in this permit:

- (a) Opacity shall not exceed an average of forty percent (40%) any one (1) six (6) minute averaging period as determined in 326 IAC 5-1-4.
- (b) Opacity shall not exceed sixty percent (60%) for more than a cumulative total of fifteen (15) minutes (sixty (60) readings) as measured according to 40 CFR 60, Appendix A, Method 9 or fifteen (15) one (1) minute nonoverlapping integrated averages for a continuous opacity monitor) in a six (6) hour period.

326 IAC 2-7 (Title V)

Engine test cell design restricts the total maximum power output of the engine test cells due to engine cooling requirements. Only 21.5% of the total maximum power output (5800 hp) will be available for testing purposes. As a result, engine emissions are based on 1251 hp due to these design restrictions.

To ensure the potential-to-emit NO_x emissions will not exceed 100 tons per year and since the emission factor is based on actual stack test data done at Cummins Engine Co. on diesel engine test cells, the emission factor is being made federally enforceable. The potential-to-emit of less than 100 tons per year of NO_x is equivalent to 550,012 gallons of diesel fuel. Therefore, the source will not be subject to 326 IAC 2-7.

State Rule Applicability - Individual Facilities

326 IAC 2-4.1 (Major Sources of Hazardous Air Pollutants (HAP))

The operation of diesel engine test cells will emit less than 10 tons per year of a single HAP or 25 tons per year of a combination of HAPs. Therefore, 326 IAC 2-4.1 does not apply.

326 IAC 8-1-6 (New Facilities - General Reduction Requirement)

This source does not have potential VOC emissions equal to or greater than twenty five (25) tons per year, therefore this source is not subject to the provisions of 326 IAC 8-1-6.

326 IAC 10-1-1 Nitrogen Oxide Rules

The source is not located in Clark or Floyd county and is not subject to these rules.

Testing Requirements

Testing was not required for NO_x because the source was limited to 550,012 gallons of diesel fuel burned per year and the NO_x emissions were limited to 355 pounds of NO_x per 1000 gallons of diesel fuel burned. The emission factor is from stack test data done in 1994.

Compliance Monitoring

Despite burning diesel fuel, visible emission evaluations are not required because PM is significantly less than 25 tpy and there is no control device. PM emissions are three (3) tons per year.

Conclusion

The construction and operation of this diesel engine test cells shall be subject to the conditions of the attached proposed New Source Construction and Minor Source Operating Permit 005-14641-00091.

Appendix A - NOx Potential To Emit (PTE) Calculations

Company Name: Analytical Engineering, Inc.
 Address: 2555 Technology Blvd., Columbus, Indiana 47201
 Permit: 005-14641-00091
 Date: November 16, 2001
 Reviewer: ERG/EH

Total Dynamometer Capacity: 5800 hp

Test Cell and Exhaust Stack Number	Projected Test Cell Completion Date	Description of Work to be Performed	Dyno Power (hp)	Max Run Time (hours/year)	Max Fuel Usage ^a (gal/hour)	Potential Fuel Used ^b (gal/hour)	NOx Factor based on Cummins ^c (lbs/kgal#2D)	NOx Factor based on 1998 US EPA Std. ^d (lbs/kgal#2D)	NOx PTE based on Cummins EF (tons/yr)	NOx PTE based on EF from 1998 US EPA Std. (tons/yr)
1	15-Jul-02	Diesel Engine Development	400	8760	20.4	4.4	355	172.5	6.83	3.32
2	01-Jun-02	Diesel Engine Development	400	8760	20.4	4.4	355	172.5	6.83	3.32
3	01-Mar-03	Diesel Engine Development	1500	8760	76.6	16.5	355	172.5	25.62	12.45
4	15-Apr-02	Diesel Engine Development	500	8760	25.5	5.5	355	172.5	8.54	4.15
5	01-Mar-02	Diesel Engine Development	500	8760	25.5	5.5	355	172.5	8.54	4.15
6	15-Oct-01	Diesel Engine Development	400	8760	20.4	4.4	355	172.5	6.83	3.32
7	30-Nov-01	Diesel Engine Development	600	8760	30.7	6.6	355	172.5	10.25	4.98
8	15-Jan-02	Diesel Engine Development	600	8760	30.7	6.6	355	172.5	10.25	4.98
9	01-Dec-02	Cold Start Testing for Diesel Engines	300	8760	15.3	3.3	355	172.5	5.12	2.49
10	01-Mar-03	Cold Start Testing for Diesel Engines	600	8760	30.7	6.6	355	172.5	10.25	4.98
Total for 10 Test Cells			5800	87600	296.3	63.7			99.0	48.1

a) Max Fuel Usage based on AP-42 brake-specific fuel consumption 7000 Btu/hp-hr = .3627 lbs#2D/hp-hr

b) Maximum design capacity is 21.5% of hp capacity due to the heat rejection capability of the process cooling water.

c) Cummins Engine Co., Inc. Title V Operating permit for diesel engine test cells: T005-7466-00002, Emission Factor Ref: SCC 2-04-004-02

d) U.S. EPA 1998 Certification Standard for Heavy-Duty Diesel Engines

e) Oct 01 and Nov 01 units have been purchased but not physically constructed or installed so they are not CWOP/OWOP units.

Appendix A - PM₁₀ Potential To Emit (PTE) Calculations

Company Name: Analytical Engineering, Inc.
 Address: 2555 Technology Blvd., Columbus, Indiana 47201
 Permit: 005-14641-00091
 Date: November 16, 2001
 Reviewer: ERG/EH

Total Dynamometer Capacity: 5800 hp

Test Cell and Exhaust Stack Number	Projected Test Cell Completion Date	Description of Work to be Performed	Dyno Power (hp)	Max Run Time (hours/year)	Max Fuel Usage ^a (gal/hour)	Potential Fuel Used ^b (gal/hour)	PM ₁₀ Factor based on Cummins ^c (lbs/kgal#2D)	PM ₁₀ Factor based on 1998 US EPA Std. ^d (lbs/kgal#2D)	PM ₁₀ PTE based on Cummins EF (tons/yr)	PTE based on EF from 1998 US EPA Std. (tons/yr)
1	15-Jul-02	Diesel Engine Development	400	8760	20.4	4.4	10.7	4.31	0.21	0.08
2	01-Jun-02	Diesel Engine Development	400	8760	20.4	4.4	10.7	4.31	0.21	0.08
3	01-Mar-03	Diesel Engine Development	1500	8760	76.6	16.5	10.7	4.31	0.77	0.31
4	15-Apr-02	Diesel Engine Development	500	8760	25.5	5.5	10.7	4.31	0.26	0.10
5	01-Mar-02	Diesel Engine Development	500	8760	25.5	5.5	10.7	4.31	0.26	0.10
6	15-Oct-01	Diesel Engine Development	400	8760	20.4	4.4	10.7	4.31	0.21	0.08
7	30-Nov-01	Diesel Engine Development	600	8760	30.7	6.6	10.7	4.31	0.31	0.12
8	15-Jan-02	Diesel Engine Development	600	8760	30.7	6.6	10.7	4.31	0.31	0.12
9	01-Dec-02	Cold Start Testing for Diesel Engines	300	8760	15.3	3.3	10.7	4.31	0.15	0.06
10	01-Mar-03	Cold Start Testing for Diesel Engines	600	8760	30.7	6.6	10.7	4.31	0.31	0.12
Total for 10 Test Cells			5800	87600	296.3	63.7			3.0	1.2

a) Max Fuel Usage based on AP-42 brake-specific fuel consumption 7000 Btu/hp-hr = .3627 lbs#2D/hp-hr

b) Maximum design capacity is 21.5% of hp capacity due to the heat rejection capability of the process cooling water.

c) Cummins Engine Co., Inc. Title V Operating permit for diesel engine test cells: T005-7466-00002, Emission Factor Ref: SCC 2-04-004-02

d) U.S. EPA 1998 Certification Standard for Heavy-Duty Diesel Engines

Appendix A - SO₂ Potential To Emit (PTE) Calculations

Company Name: Analytical Engineering, Inc.
 Address: 2555 Technology Blvd., Columbus, Indiana 47201
 Permit: 005-14641-00091
 Date: November 16, 2001
 Reviewer: ERG/EH

Total Dynamometer Capacity: 5800 hp

Test Cell and Exhaust Stack Number	Projected Test Cell Completion Date	Description of Work to be Performed	Dyno Power (hp)	Max Run Time (hours/year)	Max Fuel Usage ^a (gal/hour)	Potential Fuel Used ^b (gal/hour)	SO ₂ Factor based on Cummins ^c (lbs/kgal#2D)	SO ₂ PTE based on Cummins EF (tons/yr)
1	15-Jul-02	Diesel Engine Development	400	8760	20.4	4.4	7.09	0.14
2	01-Jun-02	Diesel Engine Development	400	8760	20.4	4.4	7.09	0.14
3	01-Mar-03	Diesel Engine Development	1500	8760	76.6	16.5	7.09	0.51
4	15-Apr-02	Diesel Engine Development	500	8760	25.5	5.5	7.09	0.17
5	01-Mar-02	Diesel Engine Development	500	8760	25.5	5.5	7.09	0.17
6	15-Oct-01	Diesel Engine Development	400	8760	20.4	4.4	7.09	0.14
7	30-Nov-01	Diesel Engine Development	600	8760	30.7	6.6	7.09	0.20
8	15-Jan-02	Diesel Engine Development	600	8760	30.7	6.6	7.09	0.20
9	01-Dec-02	Cold Start Testing for Diesel Engines	300	8760	15.3	3.3	7.09	0.10
10	01-Mar-03	Cold Start Testing for Diesel Engines	600	8760	30.7	6.6	7.09	0.20
Total for 10 Test Cells			5800	87600	296.3	63.7		2.0

a) Max Fuel Usage based on AP-42 brake-specific fuel consumption 7000 Btu/hp-hr = .3627 lbs#2D/hp-hr

b) Maximum design capacity is 21.5% of hp capacity due to the heat rejection capability of the process cooling water.

c) Cummins Engine Co., Inc. Title V Operating permit for diesel engine test cells: T005-7466-00002, Emission Factor Ref: SCC 2-04-004-02

d) U.S. EPA 1998 Certification Standard for Heavy-Duty Diesel Engines

e) Oct 01 and Nov 01 units have been purchased but not physically constructed or installed so they are not CWOP/OWOP units.

Appendix A - VOC Potential To Emit (PTE) Calculations

Company Name: Analytical Engineering, Inc.
 Address: 2555 Technology Blvd., Columbus, Indiana 47201
 Permit: 005-14641-00091
 Date: November 16, 2001
 Reviewer: ERG/EH

Total Dynamometer Capacity: 5800 hp

Test Cell and Exhaust Stack Number	Projected Test Cell Completion Date	Description of Work to be Performed	Dyno Power (hp)	Max Run Time (hours/year)	Max Fuel Usage ^a (gal/hour)	Potential Fuel Used ^b (gal/hour)	VOC Factor based on Cummins ^c (lbs/kgal#2D)	VOC PTE based on Cummins EF (tons/yr)
1	15-Jul-02	Diesel Engine Development	400	8760	20.4	4.4	17.9	0.34
2	01-Jun-02	Diesel Engine Development	400	8760	20.4	4.4	17.9	0.34
3	01-Mar-03	Diesel Engine Development	1500	8760	76.6	16.5	17.9	1.29
4	15-Apr-02	Diesel Engine Development	500	8760	25.5	5.5	17.9	0.43
5	01-Mar-02	Diesel Engine Development	500	8760	25.5	5.5	17.9	0.43
6	15-Oct-01	Diesel Engine Development	400	8760	20.4	4.4	17.9	0.34
7	30-Nov-01	Diesel Engine Development	600	8760	30.7	6.6	17.9	0.52
8	15-Jan-02	Diesel Engine Development	600	8760	30.7	6.6	17.9	0.52
9	01-Dec-02	Cold Start Testing for Diesel Engines	300	8760	15.3	3.3	17.9	0.26
10	01-Mar-03	Cold Start Testing for Diesel Engines	600	8760	30.7	6.6	17.9	0.52
Total for 10 Test Cells			5800	87600	296.3	63.7		5.0

a) Max Fuel Usage based on AP-42 brake-specific fuel consumption 7000 Btu/hp-hr = .3627 lbs#2D/hp-hr

b) Maximum design capacity is 21.5% of hp capacity due to the heat rejection capability of the process cooling water.

c) Cummins Engine Co., Inc. Title V Operating permit for diesel engine test cells: T005-7466-00002, Emission Factor Ref: SCC 2-04-004-02

d) U.S. EPA 1998 Certification Standard for Heavy-Duty Diesel Engines

e) Oct 01 and Nov 01 units have been purchased but not physically constructed or installed so they are not CWOP/OWOP units.

Appendix A - CO Potential To Emit (PTE) Calculations

Company Name: Analytical Engineering, Inc.
 Address: 2555 Technology Blvd., Columbus, Indiana 47201
 Permit: 005-14641-00091
 Date: November 16, 2001
 Reviewer: ERG/EH

Total Dynamometer Capacity: 5800 hp

Test Cell and Exhaust Stack Number	Projected Test Cell Completion Date	Description of Work to be Performed	Dyno Power (hp)	Max Run Time (hours/year)	Max Fuel Usage ^a (gal/hour)	Potential Fuel Used ^b (gal/hour)	CO Factor based on Cummins ^c (lbs/kgal#2D)	CO PTE based on Cummins EF (tons/yr)
1	15-Jul-02	Diesel Engine Development	400	8760	20.4	4.4	55.8	1.07
2	01-Jun-02	Diesel Engine Development	400	8760	20.4	4.4	55.8	1.07
3	01-Mar-03	Diesel Engine Development	1500	8760	76.6	16.5	55.8	4.03
4	15-Apr-02	Diesel Engine Development	500	8760	25.5	5.5	55.8	1.34
5	01-Mar-02	Diesel Engine Development	500	8760	25.5	5.5	55.8	1.34
6	15-Oct-01	Diesel Engine Development	400	8760	20.4	4.4	55.8	1.07
7	30-Nov-01	Diesel Engine Development	600	8760	30.7	6.6	55.8	1.61
8	15-Jan-02	Diesel Engine Development	600	8760	30.7	6.6	55.8	1.61
9	01-Dec-02	Cold Start Testing for Diesel Engines	300	8760	15.3	3.3	55.8	0.81
10	01-Mar-03	Cold Start Testing for Diesel Engines	600	8760	30.7	6.6	55.8	1.61
Total for 10 Test Cells			5800	87600	296.3	63.7		15.6

a) Max Fuel Usage based on AP-42 brake-specific fuel consumption 7000 Btu/hp-hr = .3627 lbs#2D/hp-hr

b) Maximum design capacity is 21.5% of hp capacity due to the heat rejection capability of the process cooling water.

c) Cummins Engine Co., Inc. Title V Operating permit for diesel engine test cells: T005-7466-00002, Emission Factor Ref: SCC 2-04-004-02

d) U.S. EPA 1998 Certification Standard for Heavy-Duty Diesel Engines

e) Oct 01 and Nov 01 units have been purchased but not physically constructed or installed so they are not CWOP/OWOP units.